

AIR QUALITY

March 2008 Issue 23

BULLETIN

PLANNING

AQMA houses refused

Plans for semi detached houses have been refused on air quality grounds in Halifax.

Calderdale Council rejected the application on air quality and open space grounds. The decision went to appeal, which has now been rejected, the appeal inspector confirming that poor air quality is a material issue. All cases involving planning are closely watched as there are relatively few decisions focusing on air quality, and appeals in particular form a useful precedent.

The appeal site lies within an air quality management area declared by Calderdale due to

traffic-derived NO₂ from the A629 Salter Hebble Hill. The council told the inquiry that NO₂ had risen in parts of the AQMA since declaration.

It did not argue that the development would worsen air quality – rather that there was nothing within the application to state how future occupants of the two pairs of semis would be protected from poor air quality.

The inspector said: “While the applicant argues that detailed design, at reserved matters stage, could satisfactorily mitigate any impact, there is no convincing evidence before me that this is

possible. As the evidence is not available to demonstrate that occupiers of the proposed development would not be unacceptably affected by existing sources of air pollution, I consider that it would be appropriate and justified to adopt a precautionary approach in this instance and that this would be an additional reason for the appeal to fail.”

Last year Calderdale was told to pay compensation to residents for noise and pollution from the A629 road (*AQB August 2007 p1*).

● The judgement can be viewed on <http://tinyurl.com/26ct3j>

AVIATION

Heathrow debate heats up as consultation ends

As the consultation on expanding Heathrow closes, councils and pressure groups have submitted their responses to the Government. Replies are split between support on economic grounds, and opposition on air quality and noise.

Responses were emerging as *AQB* went to press and will be covered in future editions – for now, EPUK (formerly the NSCA) has robustly challenged the expansion plans: “The discredited ‘predict and provide’ approach used to justify expansion at Heathrow, will cause thousands to suffer from unhealthy aircraft noise and air pollution. We have no faith in the Government’s assertions that critical environmental tests can be met whilst expanding the capacity of the airport, and believe that they are failing to answer some fundamentally important questions.”

Expansion of Heathrow has been made conditional upon meeting European air quality standards around the airport (which are currently being breached). The Government believes that future cleaner, quieter aircraft and cleaner vehicles on nearby roads will mean that the airport can be safely expanded with no extra improvement measures, such as road charging, needed. EPUK disagrees with this view.

“The air quality modelling used in the consultation has been subject to very little ‘sensitivity testing’, or consideration of alternative scenarios. This is extremely important, as the predicted margins of meeting European limits for the pollutant NO₂ are very tight.

“NO₂ levels around Heathrow have remained roughly static for the past 10 years despite tightening of vehicle emission

standards over this period – ‘headroom’ for aircraft emissions to increase in the future is expected to be provided by future tightening of the same vehicle emission standards. Previous tightening of the Euro emission standards have failed to deliver the scale of NO₂ reductions envisaged at the time of the legislation, and expectations for further Euro standard improvements need to be subject to a range of scenarios.”

EPUK continued: “Insufficient attention has been paid to variables and ranges of future scenarios, primarily regarding:

- Road traffic forecasts;
- Meteorological variability;
- Background air quality;
- Climate change effects (both on meteorological conditions and background air quality);
- Atmospheric chemistry.

More responses next month.

IN BRIEF

Dudgeon departs

Defra air quality strategy boss Sarah Dudgeon has moved on.

Dudgeon, who took over from the high profile Davide Minotti 18 months ago, and Rupert Furness before that, is moving to climate change within Defra. While a replacement is being found, Dudgeon’s assistant Jonathan Lartice (formerly with the Defra noise team) is standing in.

Meanwhile Defra’s air and environment quality division boss Martin Williams is standing in for his boss – and John Rea standing in for Williams.



Door revolves for Dudgeon

Climate AQ impact

A report on the health and air quality impacts of climate change has been updated.

The Health Protection Agency’s report contains direct and indirect impacts of climate change – including the effect of a hotter climate on air pollution and subsequent impacts. The report was first released in 2002 and an update was posted for comment last year (*AQB June 2007 p6*).

The conclusions on air quality reached in 2002 remain largely unchanged – most of the focus of the update is on flooding and malarial diseases.

● *Health effects of climate change in the UK, February 2008* was produced by the Health Protection Agency and can be downloaded on www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_080702

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IN BRIEF

Bath monitored

Bath schoolchildren have been monitoring carbon monoxide levels on the walking route between two school sites.

Hayesfield School pupils, as part of the Participate research project, have used hand held monitors and GPS devices to create a map of the walk which shows up the pollution hotspots.

They now want other schools around the country to take part in the project so that they can compare gathered data using Google Earth and other internet-based tools.

"The Participate project aims to demonstrate and evaluate how new technologies can help people take a more active role in creating and sharing digital content," said Dr Dawn Woodgate, from the University of Bath. "In the trial stages of the project, pupils have been asked to capture and contribute information about their local environment. 13 schools are already involved."

Doncaster heads back to school

Doncaster Council is going into schools to educate primary school children about the importance of air quality.

The scheme, part of the South Yorkshire Care4Air initiative, sees air quality officers from Doncaster going into schools to teach children about several important features involved in improving air pollution levels including; testing air quality; the law regarding air quality; how pollution affects health; and what can be done to improve pollution levels.

The scheme is designed to be relevant for each year group taking part and there are different activity sheets and presentations for every year between Year 1 and Year 6. The air quality officers organise an activity sheet to work alongside a PowerPoint presentation for the visits into schools, and follow-up work to continue the learning.

● Further information www.doncaster.gov.uk/airq/index.asp

AVIATION

BAA admits modelling mistake

BAA has admitted that dispersion modelling it carried out in support of its application to expand Stansted Airport was wrong. It now says that some areas will breach standards.

EU pollution limits would be exceeded over an area including Hatfield Forest which is nationally designated as a Site of Special Scientific Interest (SSSI) and a National Nature Reserve. BAA had said at the public inquiry that limits would not be exceeded.

Stop Stansted Expansion has responded by telling the Government: "If the true position had been provided to the public inquiry, the debate on the air pollution effects of the proposed development would have assumed a radically

different complexion."

"In the course of the inquiry, experts giving evidence on behalf of Uttlesford District Council, the National Trust, Friends of the Earth and SSE all questioned the credibility of BAA's projections for air pollution. BAA dismissed all their evidence insisting that its own projections were 'robust', 'conservative' and represented a 'realistic worst case scenario'."

BAA says that the error occurred because latest air quality assessments have found "that future background NOx levels are now predicted to be higher in future years than previously estimated".

"We now predict that NOx levels are likely to be slightly higher in 2014 in parts of

Hatfield Forest and East End Wood than were previously predicted. The levels in Hatfield Forest will still be less than those experienced today, and levels in East End Wood virtually the same. Added to which there is no evidence to show that any harm is or is likely to be occurring to vegetation. Significantly, no objectors at the G1 inquiry made the case that it would."

The Government is currently considering the inquiry inspector's report and had been expected to announce a decision by Easter.

The deadline to respond to DfT's consultation on *Heathrow* has now passed (see news, page one) and air quality will form a key part of that inquiry.

AVIATION

ADMS Airports launched for public use

Consultant Cerc has released the ADMS Airport modelling package.

Cerc says ADMS-Airport has all the features of ADMS-Urban for modelling concentrations of pollutants in a range of scenarios from rural to complex urban environments, in addition it models aircraft sources as moving jets, capturing the nature of dispersion from accelerating, buoyant engine exhausts.

It can be used to examine

emissions from 6,500 sources simultaneously, including up to 500 aircraft jet sources, 70,000 road links, up to 1500 point, line, area or volume industrial sources.

To model the airport's flight schedule in detail, users can construct up to 500 annual hourly profiles. These detailed schedules can also be used for detailed modelling of non-airport sources, such as the effect of school terms and public holidays on road traffic.

For less detailed time dependent modelling, ADMS-Airport allows up to 50 diurnal and 50 monthly profiles plus wind direction dependence for any source.

ADMS-Airport has been used to model air quality at London's Heathrow airport for the Department for Transport's (DfT) Project for the Sustainable Development of Heathrow (*AQB August 2006 p1*).

● www.cerc.co.uk

VEHICLE EMISSIONS

Hillingdon looks at own fleet emissions

A fleet audit has been carried out by the London Borough of Hillingdon.

The audit has allowed the council to produce an inventory and establish what proportion of emissions it is responsible for.

Speaking at last month's Beacon conference event held by Greenwich at the GLA in London, Hillingdon's Val Beale explained that the exercise was intended to establish a baseline for setting future targets and reduction improvements. The London low emission zone and Nottingham Declaration on

Climate Change, as well as new Defra indicators, were also important drivers.

The council has 187 vehicles including cars, vans, buses, trucks and specialist plant such as gritters. Nearly all are diesel, 77% are Euro III or better. Calculations suggest that Hillingdon fleet NO_x emissions are 11.1 tonnes – 0.7% of road transport emissions in the borough. PM₁₀ and carbon monoxide make up 0.3% of emissions.

Beale said: "We've gained valuable experience in putting

together a fleet inventory. One important lesson is to know your own fleet – it might be that vehicles are under different managers (for instance school transport fleets may report to the education department and gritters report somewhere else). Having accurate records of all council vehicles is important, and this may be easier if all vehicles came under one fleet manager."

The inventory has allowed the authority to flag up priority areas and shows the authority is leading by example.

NEWS FROM SUSSEXAIR'S CONFERENCE HELD IN BRIGHTON LAST MONTH

Sussex talks on climate change

South east England councils have heard about the challenge of integrating climate change action with air quality.

A conference organised by the Sussexair consortium focused on practical action by local authorities and regulators.

The GLA's Andy Deacon (himself formerly the Sussexair coordinator) told the conference that the GLA was rethinking its guidance on biomass provision in London. The GLA obliges developers to have a 20% renewable energy provision in new developments favouring technologies such as wood chip biomass plants.

The rethink follows strong fears raised in a recent London Councils' report on biomass. Earlier this year Edinburgh cancelled biomass boilers in new schools because of the problem (*AQB January p1*). Deacon said that the GLA is considering how guidance would take into account London Council findings.

Current Sussexair coordinator Nigel Jenkins explained how the Airlert air quality text and telephone warning system is to be expanded. Airlert relays air quality forecasts to vulnerable

groups who sign up to the service.

Until now, the service has been summer-only, but it is now set to run for the whole year allowing it to be used for other warnings such as cold weather events. Jenkins said: "Last year we had 300 subscribers, this year it looks like we will have over 500 which, here in leafy Sussex, compares favourably with what is happening across the whole of London with its Airtex scheme.

"Last year we sent out 17 alerts between May and October – some 5000 texts. A back of an envelope calculation suggests that just say we avoid 30 hospital admissions, that would save the local hospital trust over £57,000 which is good value for money."

Sussexair also emails alerts to local schools, the schools then deciding whether to pass any advice on to teachers and children. ERG's Frank Kelly told the conference: "This information could be vital. Having sports days in the hottest part of the day on a hot summers afternoon is the most stupid thing to do. There are obvious benefits in restricting

activities in these critical few hours."

The Environment Agency's Jim Storey outlined scenarios where climate change policies were having adverse impacts on air quality:

- Requirements for car manufacturers to increase fuel efficiency is leading to an increasing proportion of diesel vehicles in the car fleet. This has the potential to increase NO_x emissions by 76%;
- Increased use of biofuels should have little adverse impact on air quality – provided the specification is tight. "But there's the rub – often it's not," said Storey;
- The recent London Councils' biomass report has 'caused chaos' with planning applications for biomass plants being stalled: "This is good as it suggests that air quality officers are talking to planners.";
- The increase in carbon dioxide emissions resulting from expansion of Heathrow is "horrendous" said Storey. "Dubious evidence is presented that there will not be an effect on air quality. Sorry – but the Environment Agency disagrees."

RESEARCH

Nano fears prompts research programme

Increasing fears about engineered nanoparticles have prompted more research funding on potential health effects.

Engineered nanoparticles are ultrafine particles that have been designed to have a function. They are used in applications such as paints and sunscreen lotions. Relatively little is known about their environmental effects on humans, the fear being that as some nanoparticles are built as tubes and fibres, they could behave like asbestos and create a hidden health burden in the future.

The Department of Health's Policy Research Programme is currently seeking proposals for a £650k programme research on nanotoxicology involving:

- Determining the

characteristics of nanomaterials that confer toxicity;

- Inhalation studies using nanomaterials;
- Studies of the transfer of nanoparticles across skin.

The government's top air quality and health advisor Bob Maynard of the Health Protection Agency has hitherto focused on conventional air quality issues but is now setting up a dedicated nanoparticle research group within the HPA. Five universities will cooperate and link with groups in Germany and Italy. This year will be a focus on physics, next year toxicology will start.

Speaking at the recent UWE conference held in Bristol, Aberdeen University's Jon Ayres said: "When you look at nanotechnology industry, it is

racing away and making a massive contribution to UK's GDP and is important.

"But there are concerns about its use of – for instance – nanotubes which may have the characteristics of asbestos and could be very, very nasty. Effects may only manifest themselves many years down the line and we need to be able to develop techniques to identify any adverse effects even if there is no short term response."

Meanwhile the US is also recognising potential health hazards of nanoparticles and has launched a research programme, albeit with a considerably larger budget.

- website www.nihr-ccf.org.uk/site/docdatabase/prp/prp_nanotox_docs/PRP%20Nanotechnology%20research%20brief.doc

IN BRIEF

Permit revamp

Core guidance on the new environmental permitting regime has been released.

Environmental Permitting absorbs the LA-PPC and IPPC regimes, waste management and exemptions. Most of the current changes affect waste management in a bid to cut red tape involved with regulation.

Defra has had a series of road shows and talked to over 300 local authorities explaining the impact of the scheme. Last month it released guidance on the PPC aspects of most relevance to local authorities (*AQB February p4*).

- *Environmental permitting core guidance* can be downloaded from www.defra.gov.uk/environment/ppc/localauth/publications/guidance/manuals.htm

Coventry deaths?

Incineration in Coventry is raising infant death rates, anti incinerator campaigners claims.

Campaign group UK Health Research has analysed three years of official infant death rates in the Coventry area, and compared infant deaths in 'upwind' wards with those in selected 'downwind' wards relative to an incinerator.

They say that upwind of the incinerator there is a zero per cent death rate – but downwind there have been 50 infant deaths – and an 8.7% infant death rate.

Similar analysis has shown that electoral wards that are downwind of the Ironbridge Power Station had an infant mortality rate three times that of the upwind wards.

Coventry told *AQB* that the analysis of wards did not take into account issues such as poor standard of living, poor housing conditions, poor nutrition and higher obesity levels.

- www.ukhr.org

Swiss nanotalks

The 12th conference on combustion generated nanoparticles will take place in Zurich on 23rd–25th June.

- www.lav.ethz.ch/nanoparticle_conf/index

IN BRIEF

Scots biomass boost

Scottish Government is being urged to encourage renewable heat (including biomass) despite fears about air pollution.

A report for Scottish Government by the Forum for Renewable Energy in Scotland says that Government should recognise the benefit of renewable heat technologies to improving air quality, particularly where they replace oil and coal heating – and put in place a “supportive planning and regulatory framework that (ensures) air quality management does not disproportionately penalise biomass or other renewable technologies”.

It recognises that particles are a serious issue in some urban local authority areas, and that biomass boilers can have a higher level of particulate emissions than modern gas boilers. It says: “Work is currently ongoing to assess whether or not increased numbers of biomass boilers, particularly in domestic-scale systems, are likely to impact on air quality. The Forum recognises that any action to develop and expand the renewable heat sector, in particular bioenergy, will need to consider carefully the potential impact of this increase in use on air quality and of pollutants on public health.

Edinburgh City Council recently cancelled provision of biomass in new schools in its area because of biomass pollution fears (*AQB January p1*).

● *Scotland’s renewable heat strategy: recommendations to Scottish ministers* can be viewed on www.scotland.gov.uk/resource/doc/211131/0055786.pdf

London Councils link

London Councils has posted its biomass study on the web (*AQB January p1*).

● It can be found at www.londoncouncils.gov.uk/doc.asp?doc=21683&cat=1027.

MONITORING

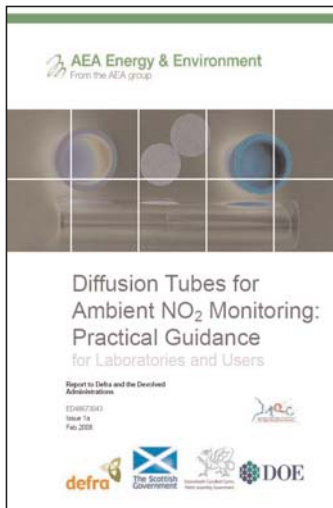
Tube analysis guidance finalised

Guidance on the analysis and use of nitrogen dioxide diffusion tubes has been released in a bid to harmonise practice among local authorities.

AEA and Air Quality Consultants have produced the practical guidance in the absence of more official guidance from the UK or Europe. It aims to overcome much of the inconsistency associated with use of tubes, which are a cheap and cheerful means of gathering indicative NO₂ levels in an area.

Variation exists as there are many laboratories supplying tubes, and many analysing them. Lack of standardised procedures has led to variations, with some laboratories significantly worse than others (*see laboratory intercomparison AQB January p6*).

A working group was set up incorporating tube firms, Defra and the devolved regions and local authorities to prepare the practical guidance which users are expected to follow within a year: “It should be noted that this document does not constitute a formal standard method. However, in the absence of an international, European or UK standard method for diffusion tubes, this guidance is intended to form the basis of harmonisation of methods within the UK, until such time as a standard method is developed. Defra and the Devolved Administrations will



expect laboratories to implement this guidance, for diffusion tubes used by local authorities for local air quality management, by the beginning of January 2009.”

Most of the guide focuses on the preparation and analysis of tubes. It reaffirms that diffusion tubes should be prepared using one of the two harmonised methods (50% TEA / 50% acetone, grids dipped in solution or 20% TEA / 80% water, 50% of solution pipetted onto grid).

A section contains advice for local authorities placing tubes. Advice includes:

● Tubes are useful for identifying areas of high NO₂ concentration, particularly when dealing with sources such as traffic emissions, which do not change much from day to day;

- They are less useful for monitoring ambient concentrations around specific emission sources such as industrial plant, as they cannot identify short-term fluctuations in NO₂ as may result from fluctuations in wind direction;
- Tubes should be placed in areas of ‘relevant public exposure’ The immediate area around the sampler location must be open, allowing free circulation of air around the tube. Ideally, samplers would be placed at breathing height, but in order to reduce theft of tubes, it is recommended that tubes are placed at a height of 2-4 m. Safety should be an important consideration when siting tubes at height or near to roads;
- Kerbside sites should be within 1m of the kerb, and are usually fixed to street furniture. Roadside diffusion tubes should be sited between 1m and 5m from the kerb edge, and mounted ideally either on a lamp post or road sign on the pavement, or on the face of a building adjoining the pavement.
- Urban background sites must be located a set distance away from any major source of NO₂, such as multi-storey car parks or busy roads, petrol stations or ventilation outlets from catering establishments or where vehicles idle.
- Guidance can be viewed on www.airquality.co.uk/archive/reports/reports.php?report_id=499

MICROGENERATION

EPUK forum to raise biomass fears

EPUK (formerly the NSCA) has put together a working group to consider the conflicting air quality and climate change issues concerning biomass installations.

Fears have been raised that widespread use of biomass in city centres could jeopardise air quality concentrations.

Edinburgh recently cancelled biomass provision in new schools and London Councils produced a report warning that widespread uptake would significantly worsen air quality (*AQB January p1*).

UWE, which is in the grouping, comments: “There is general agreement that local authorities need greater awareness of the issues posed by biomass burning, as this is becoming a popular option for providing ‘reduced carbon’ energy. The air quality consequences for the introduction of biomass burning back into our communities result not just from stack emissions, but also from the need, in many cases, to deliver fuel by trucks.”

EPUK’s new Biomass and

Air Quality Review Group is seeking to produce guidance for both local authorities and developers on some of the issues surrounding emissions from the flurry of biomass boilers that are being installed in an effort to reduce climate change impacts.

This guidance is anticipated to deal with advice on how to deal with individual biomass installations as well as trying to develop a more strategic, forward-looking approach.

● Ed.Dearnley@environmental-protection.org.uk

NEWS FROM THE UWE/EPUK SOUTH WEST DIVISION CONFERENCE HELD IN BRISTOL LAST MONTH

Bristol cohort moves on to air

The recent UWE conference heard details of a huge study of babies born in Bristol and how they could help air pollution and health research.

The *Children of the nineties* study enrolled over 14,000 expectant mums onto the study in the 1990s, with 13,800 of their children now being followed up. All eligible mothers were asked to join, and researchers got a 94% response rate which works out at about 85-95% of the population

Detailed questions about the environment and the mother's and partner's lifestyle were taken, as well as DNA of children and parents, blood &

placenta samples, urine and teeth. The aim is to follow the individuals into the future and certainly in terms of the DNA samples, technology has caught up with the study and these results will be interesting.

Work has been completed on indoor environmental factors (such as cleaning sprays), those studies calculated the total environmental burden and then ranked subjects. The adjusted odds of persistent wheeze is 2.3 times more for those in the 10% of households with the highest environmental burden compared to the lowest 10%.

Similarly birthweight of babies from mothers with a high

environmental burden is 99.8g lower than those with lower burden – “not inconsiderable and shows that environmental impacts can be the same as that of being a heavy smoker”.

Exhaustive analysis of health outcomes with ambient air quality data has not yet been completed.

Bristol's Peter Fryer told *AQB*: “We have done some correlations with data down to ward level and data appears in the annual Bristol quality of life reports. We are also starting an MRC funded project run by Imperial College looking at some of the Bristol cohort in much more detail.”

MONITORING

Enviro Technology's Trafficbox packs it in

Enviro Technology launched its Trafficbox at the UWE/EPUK Bristol conference – a small cabinet containing instruments designed to monitor various pollutants.

ET says that until now, the choice for local authorities has been between small-scale diffusion sampling, or a full reference chemiluminescent monitoring station: “Now there is a third option in the ultra-compact Trafficbox which can measure up to six pollutants, as well as taking environmental parameters including temperature and noise into account.

“Measuring 520 x 250 x 700mm, the

real-time air quality system can be mounted onto lamp posts, railings, or other street furniture without planning permission. It can monitor ozone, NO₂, CO, SO₂, CO₂, VOC – plus PM₁₀. ET calculates that a local authority using up to ten diffusion tubes

per month to measure for NO₂ will recoup the purchase cost of a Trafficbox in just 12 months.

The unit operates on batteries, solar power, or mains electricity, using high performance analytical GSS technology to measure pollutants. The data collected is then stored internally and available in real-time or short-term resolution to a PC via GSM, modem, or other communications options.

ET's Duncan Mounsor commented, “Trafficbox is the perfect solution for local authorities looking for a way to monitor roadside air pollution without incurring the financial costs of full reference monitoring.”

● www.et.co.uk



ET's Trafficbox

HEALTH EFFECTS

UWE and Cranfield in composting probe

UWE in partnership with Cranfield University is studying toxic emissions from composting activities.

The NERC-funded research project is focusing on bioaerosols of microbial, plant or animal origin which have potential health risks if inhaled, perhaps causing infections and irritations of the respiratory

system.

UWE says: “This project aims to develop new knowledge of a specific bioaerosol component of concern known as endotoxin. The project aims to find out how much endotoxin is released from composting facilities, how far it will travel and whether the concentrations found in air from compost

facilities can harm the health of people living close to sites.

“Six days of monitoring have been completed, and samples have been analysed. We will undertake atmospheric dispersion modelling to determine the bioaerosol concentrations and impact ‘footprint’ area in the vicinity of a composting facility.”

LTP tie up rated

A postgrad student has studied the incorporation of air quality action plans in the local transport plan process.

Speaking at the recent UWE/EPUK conference held in Bristol, Dotun Olowoporoku told the audience: “The aim of the three-year research project is to investigate the potential improvement for integrating air quality into LTP2.

“This was done by exploring the inter-professional collaborations between environmental health officers and the transport planners. The research is into its second year and a questionnaire has already been concluded in December.”

Two types of questionnaire were sent out to AQMA authorities and transport planners. The response rate shows an average of 49% from both questionnaires.

Preliminary findings show just over half of staff from both departments preferred the new approach of addressing the transport-related air quality problems through the LTP rather than relying on action plans.

“However, there are disparities of opinions on the effectiveness of the communication between the environmental health and the transport planners. 42% of the EHOs believe that communications are not effective compared to 88% transport planners who believe they are. These views are reflected on the perception of how air quality is prioritised within the LTP documents. While most of the transport planners (78%) believe that they paid enough attention to air quality during the implementation of the LTP, 52% of the environmental health officers surveyed thought otherwise.

EHOs believed air quality came bottom of the pile in terms of priorities within the LTP process. Olowoporoku also highlighted the finding that the differing timescales between the air quality review and assessment process and the LTP programme made things difficult.

IN BRIEF

Forecasting meet

This year's National Air Quality Forecasting Seminar is to be held on May 14th in London. Themes will include health and advanced modelling.

● Contact AEA, Iarla Kilbane-Dawe email I.Kilbane-Dawe@aeat.co.uk

Yorkshire fleet event

Sheffield City Council and Cenex are holding a two day event on the 10th and 11th of March aimed at greening transport fleets.

Day one will focus on innovation and technology – electric and hybrid cars and vans, natural gas and fuel cell vehicles, dual fuel diesel trucks, and future developments towards a hydrogen economy. Day two will cover low emission transport strategies from procurement and waste management to planning and economic development, where they can assist public and private organisations to reduce carbon emissions and also air quality.

● www.cenex.co.uk/news-industryevents.asp

Biofuel rethink

The Government is reviewing its biofuels policy.

The Renewable Fuels Agency will lead a study of the wider economic and environmental impacts – particularly the indirect impacts – of different forms of biofuel production.

The results of the study will help inform the development of both the UK and EU's policies in this area, and will underpin the consideration of EU biofuel targets after 2010.

Announcing the review, transport minister Ruth Kelly said: "Biofuels have the potential to help reduce the impact of transport on the environment, provided they are sustainable. That is why we are introducing the new Renewable Transport Fuel Obligation in April. The RTFO will allow us to gather a wealth of data on the impacts of biofuels, which we will take into account in determining future levels of support for biofuels."

● www.dft.gov.uk/rfa

ACTION PLANS

Fresh air for London walkers

Central London walkers can now benefit from a new service that helps them plan out 'fresh-air routes' that avoid pollution areas.

The online walking route planner, walkit.com, has worked with the City of London Corporation and seven London boroughs to gather information for walkit.com's website to help people avoid the Capital's more polluted streets.

The new service will be particularly helpful to people who suffer from respiratory and cardiac conditions, such as asthma, bronchitis and emphysema.

For example, a brisk walk along a 'low pollution' route from Angel to Old Street tube stations (see map, right) takes about 19

minutes and follows the less-polluted Regent's Canal and various back streets. A direct route, which takes in the busy City Road, takes only four minutes less.

Jamie Wallace, founder of walkit.com says: "Many people know that walking is often the smartest and healthiest way to get around central London, but

they also want to know more about the qualities of the route they take. With this new service, you get the double bonus of working out walking routes that not only keep you fit, but also steer away from pollution."

Ruth Calderwood of the City of London says: "Although overall air quality has improved considerably over the last

decade in the UK, poor air quality still poses a real risk to people who suffer from certain conditions. By having this new information on walkit.com's website, people can work out the best routes for themselves and hopefully, it'll have a positive effect on their health."

● www.walkit.com



MONITORING

ERG releases annual London AQ report

The 13th annual report of the London Air Quality Network has been published. The report spans both 2005 and 2006 providing detailed results of measurements in 2005 and outlining the pollution changes during 2006.

During 2005 there was little change in annual mean concentrations in London; changes in the LAQN index value for all pollutants were within the range of +/-3%. However, provisional results for 2006 indicate an increase of 19% in the annual mean index for ozone and a further increase

of 3% in annual mean PM₁₀. The annual mean indices for CO, NO₂, NO_x and SO₂ all decreased during 2006.

Considering the longer-term perspective, from November 1996 to the end of 2005, the LAQN annual mean index reduced for all pollutants except ozone; the annual mean concentrations of ozone showed a substantial increase during the period from November 1996 to the end of 2005 (+37%) and provisional measurements from 2006 suggested a further substantial increase during the year. The annual mean index for

PM₁₀ reached a minimum during 2000 and provisional results from 2006 suggest an increase of 8% since this time. During 2003 London experienced a series of prolonged PM₁₀ episodes during the spring and summer and as a consequence many roadside sites exceeded the EU limit value. Despite an absence of such prolonged episodes during 2006, provisional measurements suggest that roadside PM₁₀ concentrations during the year were similar to those measured during 2003.

● www.londonair.org.uk

EPISODES

Early pollution event noted by ERG

Elevated concentrations of particles and NO₂ have been measured at several monitoring sites across London and south-east England between 10th-13th February 2008.

Kings College ERG reported that PM₁₀ levels started to rise during the afternoon of Saturday 9 February due to still, calm weather conditions (frequent

blue skies and frosts). Moderate PM₁₀ levels were reached at several roadside sites, mainly in west London on Sunday 10th February. On Monday 11th February, additional roadside sites breached the moderate threshold, increasing the next day and incorporating some background sites.

On 13th February, 40 sites

have measured moderate PM₁₀ particulate which include further sites in background locations. High PM₁₀ has also been measured at the Hounslow 5 roadside site alongside the A4/M4.

The poor pollutant dispersion also resulted in moderate NO₂ levels at some London roadside

● **continued right**

IN BRIEF

LONDON TRAFFIC

Charge yields 'modest' benefit

The London congestion charge has led to a modest benefit in life expectancy London researchers suggest.

The charge was introduced to cut traffic and never had any intentions of improving air quality, however the reduction in traffic and congestion has been modelled to suggest a benefit. ERG's latest research carried out more detailed analysis to show that the charge avoided 1,888 years of life lost due to NO₂ and PM₁₀.

Researchers said: "We focused on the original zone, and assessed the impacts of air pollution on health within the

zone and across London as a whole. We used models of annual levels of air pollution based on measurements of changes in traffic flow across London.

"The results showed that there was little change in pollutant levels in London as a whole. But there were more substantial falls in the charging zone. Levels of NO₂ fell the most," they explain.

There were smaller falls in particulate matter levels, which the authors ascribe to the comparatively large amount that comes from outside the capital and the fact that sources other

than vehicles contribute to this form of pollution.

But the reduction in both pollutants was greatest in the most deprived areas of London. They add: "Policies affecting a larger geographical area and residential population, and which directly aim to reduce vehicle emissions, are likely to have larger public health impacts."

● *Spatial and socioeconomic air pollution and mortality benefits of the London*

Congestion charge, Cathryn Tonne et al, Occupational and Environmental Medicine online. website <http://oem.bmj.com>

Congestion charge draws mixed views

London mayor Ken Livingstone is going ahead with plans to charge larger 'gas guzzlers' £25 through the central London congestion charge.

The move, which is separate to the greater London low emission zone (AQB February p8), will penalise large engined cars with a £25 charge while allowing the cleanest band A and B vehicles to avoid the need to pay.

The move is focused on CO₂ improvements but will have obvious pollution implications. Smaller cars will result in less NO_x – but as EPUK (formerly NSCA) has pointed out, the charge may prove to be a "missed opportunity" as it will drive many towards diesel – and users of low emission cars will no longer have any disincentive to drive.

Simon Birkett of the Campaign for Clean Air in London supports the graduated

charge but with reservations: "The Campaign for Clean Air in London (CAiL) fully supports road pricing and sharply rising 'polluter pays' charges as part of a strategy for London to comply with air quality laws.

"However CAiL wants much fairer polluter pays charging based on the amount and type of fuel actually burnt. In particular, diesel engined vehicles in cities should pay much more because, while they produce slightly less carbon dioxide, they emit much more of the hazardous PM and NO_x.

"Despite flaws in the scheme, the new CO₂ charge is likely to create a significant behavioural 'tipping point' for road users that will reduce air pollution in London and it should be supported for that reason."

Motor trade body SMMT says the move will show a CO₂ saving of 8,100 tonnes compared to total ground-based

transport emissions in London of 9.7 million tonnes. "In other words just 0.084%. This compares to average new car CO₂ emissions which have come down by 13% in a decade, saving an estimated million tonnes of CO₂ each year. Further, "independent" reports suggest that changes could encourage between 4-10,000 additional cars onto central London roads."

The charge is set to be challenged by Porsche. It argues the charges will affect not just its cars but also larger family cars, such as larger people carriers, and many SUVs. It says the savings expected in an entire year from the emissions charge will be equal to the emissions from Heathrow between four minutes and at most four hours, adding it is to seek a judicial review.

● www.porschejudicialreview.co.uk

EPISODES (CONTINUED)

Early pollution event (continued from page 6, left)

sites, including Kensington and Chelsea, Hammersmith and Fulham and Luton in Bedfordshire with elevated levels elsewhere across the south-east

ERG added: "The thresholds for moderate PM₁₀ and NO₂ are different to the short-term EU limit value concentrations, which causes considerable confusion in understanding the

importance of episodes and the areas affected by them.

"Assessing air pollution against the short-term EU Limit value concentrations provides a slightly different view of the severity of the episode. Since the start of this episode on 10th February, 118 monitoring sites in London and our regional networks have measured days with mean PM₁₀ above the EU

limit value concentration. In addition, 42 sites have measured hourly mean NO₂ concentrations greater than the EU limit value concentration of 200µg/m³ during this episode, including sites outside London. These measurements contribute towards the 18 hourly means per year permitted before the EU limit value is breached.

● www.londonair.org.uk

Inspired data

Consultant Bureau Veritas is to develop and prototype Inspire directive-technical specifications for air, water, waste and biodiversity environmental monitoring facilities for the European Commission's Joint Research Centre (JRC).

The Inspire directive aims to harmonise data standards so that member states' data can be easily presented and used across the EU (AQB October p4). The project will be led by Bureau Veritas' Ana Grossinho.

Bureau Veritas will be leading and technically coordinating a multi state consortium that includes Defra and DfT. Expertise will cover data types and structures including: monitoring networks, Environmental Monitoring Facilities (EMF) management systems, organisations' internal administrative systems and management procedures, data handling and storage methods and geographical conditions.

The call for tender reflected the work the European Commission is currently engaged with, via its Institute for Environment and Sustainability (IES), in regards to linking current and future environmental legal reporting obligations under the corresponding thematic directives (air, water, waste and biodiversity) with the Inspire directive requirements.

● Bureau Veritas contact email ana.grossinho@uk.bureauveritas.com

Nanoparticles studied

A study has been released that sets out the risks posed by engineered nanoparticles.

Findings are contained in the government's second research report on the environmental and health risks of nanoparticles.

● *Characterising the potential risks posed by engineered nanoparticles* can be viewed on www.defra.gov.uk/environment/nanotech/research/reports

More work on FDMS model

ERG has won a contract to further develop a model that may save the Teom

Kings College London's Environmental Research Group (ERG) has won further funding to develop its 'volatile correction model' for particle measurement.

Defra wants the group to test the model to see whether it is valid on an hourly basis, and nationally. Results will be put into a web portal as a means of cascading locally-relevant correction factors to Teom users.

The volatile correction model has been developed in a bid to try and tie-in results gained from the current stock of 'old style' Teom particle monitors with those from new FDMS Teoms. FDMS's are being introduced following a Defra intercomparison study that concluded that the Teom was not compatible with European reporting requirements (*AQB July 2006 p3*).

Replacing the ubiquitous Teom with FDMS is a frightening prospect. Upgrading each Teom costs several thousand pounds – more if the extra equipment cannot be housed in the current cabinets. Also epidemiologists do not want to disrupt Teom data flow as many health impacts are measured against it, disturbing readings could undermine attempts to spot subtle health impacts of ambient pollution.

Even before the intercomparison conclusions that the FDMS could be considered equivalent to the European reference method, ERG's David Green had been studying results coming in from a few London boroughs that had had the foresight to install FDMS's in its early days of development. Those results contained interesting conclusions that the 'purge' measurement obtained by FDMS instruments (see technical explanation, right) could be used as a correction factor for nearby Teoms.

This was a breakthrough and was leapt on by Defra and other users who could see that if such a factor was indeed solid and reliable, it would need to convert far fewer Teoms than would otherwise be the case. ERG was given money to carry out comparisons, and that report was released towards the end of the year.

It set out arguments put forward at many recent conferences (eg *AQB Jan 2007 p1*) and formalised the thinking that normal Teoms could be considered to be equivalent to the European standard method if they were corrected with the factor obtained from FDMS purge readings. The report shows that in fact, the purge factor appears to be valid beyond the local area – it could be used up to 200 kms away. Whole swathes of

Teoms could be retained rather than junked if this method could be proven – as now looks likely.

The purge correction is far more sophisticated than the crude '1.3' factor used previously. The 1.3 factor was a percentage uplift and was intended to reflect that volatiles are driven off in the 50 deg C inlet of the Teom (to drive off water vapour).

The trouble was that this factor was crude and deliberately conservative so that some authorities suspected they were over-declaring their air quality management areas (although a few suspected their area had so many volatiles that a larger factor should be used).

The beauty of ERG's volatile correction factor is that it is directly measured in the FDMS at 12 minute intervals so is always going to properly reflect the volatiles in the mix and in real time. Predominantly such volatiles are contained in the longer range regional background particles. There are surprisingly few volatiles contained in traffic particles at the roadside – or other special sites such as near waste transfer stations. Teoms are quite good at measuring the particles from traffic or waste sites, the variation such stations has found has been due to the regional background, and now there is a sensible factor available.

And unlike the 1.3 factor – the purge factor is an absolute ($\mu\text{g}/\text{m}^3$) number, which clearly relates far more sensibly to background volatiles than the 30% uplift applied to old Teom results.

The new study just let takes all this one stage further. David Green told *AQB*: "Further development of the volatile correction model will focus on two key areas of development: "Firstly, the model will be tested for applicability on an hourly basis using the FDMS measurements from the UK equivalence trials. Secondly, the measurements of volatile particulate matter from the first phase deployment of FDMS instruments in the AURN will be assessed with respect to their application in the model on a national scale.

A web portal will also be developed; this will allow local authorities throughout the UK to download a daily, site-specific correction factor for their Teom instruments, which will provide them with reference equivalent measurements of PM_{10} .

This will be hosted by King's with a link provided through www.airquality.co.uk.

What is a purge factor?

Teom particle monitors are complicated – the FDMS is even more complicated. Sadly one has to grasp how they work if one is to understand purge factors.

A conventional Teom measures particles by passing a flow of air over a filter which is held on a balance. The frequency the balance oscillates relates to the mass of particles collected on the filter.

However a particle is a random mix of solids which may or may not contain volatiles such as ammonium nitrate which can be released or absorbed from the particles trapped on the filter. A conventional Teom heats the intake air flow to 50 deg C to drive off the water vapour – but this process also drives off volatiles, one cause of the known Teom under-read. FDMS machines have intake heads set at the lower temperature of 30 deg C and uses a drier to remove water vapour.

Crucial to the understanding of the FDMS is that almost as quick as volatiles (but not the particles themselves) deposit onto the filter, they evaporate off it, and this constant loss of weight is another reason Teom's under-read compared to gravimetric filter paper devices.

R&P, in close cooperation with Air Monitors, introduced the FDMS into the UK. Think of the FDMS as a switch, for six minutes 'raw' air is passed over the Teom sampler, for the next six minutes the air goes through a special filter that takes out all particles and volatiles and that cleaned air then passes over the Teom filter.

During the six minutes that particle-laden air passes over the Teom, particles and volatiles build up (and are lost) just as for a normal Teom. But during the second 'purge' phase, the clean air drives off the volatiles on the filter (but not the lodged particles) and the weight loss is measured – this is the 'purge' measurement and represents the volatiles that are lost to the conventional Teom.

ERG's David Green has incorporated this into a model which shows that conventional Teom's can be corrected by adding the purge factor derived from FDMS's: "Our model passed the equivalence criteria using remote FDMS purge measurements over a maximum distance of approximately 200 km (22 out of 23 tests at less than 200 km passed the equivalence criteria, the single failure was marginal). This proves that the model is a viable tool for correcting measurements from Teom instruments on the national and local government networks using FDMS purge measurements from a more limited network of sites.

The current and planned installation of FDMS instruments in the UK was found to provide adequate coverage for the model to be applied in all locations in the UK except parts of Scotland and Northern Ireland, where three additional FDMS instruments would be required. Additional FDMS instruments were also recommended in East Anglia, the northeast, the northwest, Kent and the south coast to enhance the coverage in England.

Lacors gets its kit out

A user friendly 'toolkit' has been produced for air quality action planning

Local authority group Lacors has produced a user-friendly 'toolkit' for helping councils take action on air quality.

LACORS (the Local Authorities Coordinators of Regulatory Services) is the local government central body responsible for overseeing local authority regulatory and related services in the UK. It takes a close interest in air quality, noise and other environmental health issues.

The guide was produced in-house by Lacors "after it emerged that the UK is projected to miss a number of air quality targets". It contains many of the ideas contained in its climate change toolkit as there are many actions that have both climate change and air quality benefits.

Lacors says: "Addressing poor air quality is an important part of councils' environmental protection work and there are a large number of councils doing exciting and innovative things in this area. LACORS produced this toolkit as a one-stop-shop for councils, with useful information and examples of a wide variety of projects and initiatives which are helping to drive up air quality action across the country.

"Councils are best placed to decide what will work best in their local area. Problems such as traffic congestion and industrial emissions will vary from place to place, so it's good news that councils can use the toolkit to see what is working in other towns and cities and decide how they can best improve air quality for local people."

The document highlights how the Rogers Review set out six national enforcement priorities for regulatory services one of which is air quality (*AQB April 2007 p1*). Lacors says: "The review highlights the importance and raises the profile of councils' air quality work. Officers may find it helpful to reference the review when carrying out internal funding or local area agreement negotiations."

It also points local authorities to new performance indicators, including NI 194: *Level of air quality – Reduction in NO_x and primary PM₁₀ emissions through local authority's estate and operations*. These will form part of the new Local Area Agreement (LAA) and Comprehensive Performance Assessment (and Comprehensive Area Assessment from 2009) processes. It adds: "Although they must report on all 198 national indicators from April 2008, councils may select up to 35 of the national indicators for inclusion as local performance targets in their Local Area Agreements. The primary focus for Government's performance management will be on those indicators against which targets are agreed in the LAA.

Examples of local indicators that councils could use include:

- To exceed legal health standards no more than x days per year;
- The measured concentration of NO₂;
- Number of days per year when air pollution is moderate or high.

Other advice contained within the document includes air quality side effects from tackling climate change. "Many of the things people are doing to cut CO₂ may also help to reduce air pollution. For example, reducing the use of cars by promoting alternatives such as cycling will have benefits for both climate change and air quality. However, it is possible that this may not always be the case and that air quality could suffer due to the focus on climate change."

This was amply demonstrated by recent research carried out by London Councils into biomass use which concluded that the cumulative impact across London of increased small-scale biomass use has the potential to lead to a substantial increase in air pollutants.

Case studies include: Colchester Borough Council had problems monitoring its **Section 106** agreements. The planning department workload was too high and there were a number of 'orphaned agreements' due to turnover in staff. The council was also losing planning gain by missing certain trigger points. Colchester set up a low cost database and appointed an officer with responsibility for monitoring the Section 106 agreements within the council. The database was so effective that Colchester claimed £3.7 million in gain for 2004. The database is currently monitoring almost £60 million worth of obligations.

Stationary idling causes unnecessary air pollution, noise and wastes fuel. By enforcing regulations, councils can help to reduce these and improve air quality in their area, remembering that restarting the engine uses less energy than 10 seconds of idling.

The **London Borough of Hillingdon** has used anti-idling regulations to contribute to air quality improvements in its area. Hillingdon has targeted schools, as it identified parents idling their engines whilst waiting for their children as a particular problem. The council has provided 39 schools with 88 signs to encourage people collecting children from school to turn off their engines whilst waiting.

Arun District Council and **West Sussex County Council** have jointly funded a project to reduce emissions from idling engines waiting at level crossings. All six level crossings within the district now display signs which encourage drivers to

Cut Engine, Cut Pollution.

Differential parking rates can help to improve local air quality by encouraging people to use vehicles with smaller engines which are more efficient and less polluting, helping to reduce levels of particulates and nitrogen dioxide, as well as carbon dioxide. Camden, Hackney, Richmond and Islington have gone down this route.

Air quality alerts provide free information about air pollution and related health advice to those with medical conditions that are exacerbated by air pollution, such as asthma, emphysema, bronchitis, heart disease or angina.

Subscribers receive a text message to their mobile phone, a recorded voice message to their home phone or an email the evening before, or the morning of an expected air pollution episode. The messages can also contain health advice for differing levels of pollution.

Alerts allow people with medical conditions that are affected by poor air quality to change their behaviour and reduce the impact of pollution on their health. Sussexair has successfully introduced its Airalert system.

Community monitoring involves members of the public in actively monitoring air quality and levels of pollutants in their areas. This might be carried out by existing community groups, schools and individuals who are concerned about air quality in their area, with the council playing a coordination role. NO₂ diffusion tubes are commonly utilised, as they are small and easy to use and have been used successfully by Sheffield and Sefton.

Freight quality partnerships are partnerships between local authorities, the freight industry and other interested stakeholders. Partnerships have been set up by a number of councils across the country and have resulted in improved freight distribution but also a better local environment by:

- Improving air quality by promoting the use of cleaner and more fuel efficient vehicles;
- Minimising pollution and reducing greenhouse gas emissions;
- Reducing noise nuisance and other disturbance from freight movement;
- Increasing the efficiency of the freight transport industry and encouraging the use of alternative, more environmentally friendly means of freight (including rail and sea).

● *Air quality toolkit: local action for cleaner air* can be viewed on www.lacors.gov.uk/lacors/upload/16825.doc

SCIENCE SHORTS

Could pollution lead to diabetes?

Traffic pollution could increase the incidence of diabetes, US researchers suggest. It has been suggested before that pollution could worsen the condition of diabetes sufferers, this study suggests long term exposure to traffic pollution could increase the risk of having diabetes in the first place.

Nearly 8,000 respiratory patients in Toronto and Hamilton were studied and their exposure to nitrogen dioxide (as a marker of traffic pollution) was established.

Researchers found that for each 1ppb increase in NO₂ exposure in Toronto and Hamilton there was a 5.5% and 3% respective increase in risk of having diabetes. Across the interquartile range (about 4ppb), there was a 17% increase in risk for women to have diabetes after adjusting for confounders such as age, body mass and income. There were no positive associations for men.

They conclude: "Diabetes is a major cause of world wide morbidity and mortality and the increased prevalence of diabetes in Ontario has already passed WHO projections for 2030. These results suggest that common air pollutants are associated with diabetes and warrant more investigation to determine if this is a cause and effect relationship."

The relationship between diabetes mellitus and traffic related air pollution, Robert Brook et al, *Journal of Occupational and Environmental Medicine*, 2008, Vol. 50, pp32-38.

PM_{2.5} and stress

Oxidative stress is an important pathway for the ability of fine particles to adversely affect heart rates, Boston researchers conclude in a study of 539 elderly subjects.

Particulate air pollution, oxidative stress genes and heart rate variability in an elderly cohort, Teresa Chahine et al, *Environmental Health Perspectives*, Vol. 115 no 11(2007) pp1617-1622.

VEGETATION

Trees could clear up particles

Trees could make a significant difference air quality in urban areas in the UK.

Researchers have used dispersion modelling to estimate the improvements to air quality in the West Midlands and Glasgow.

Trees are efficient scavengers of particulate matter and this can be modelled by first modelling an area with a low level of tree cover, and then modelling it with higher tree cover to see the difference.

Researchers say: "The model predicts that increasing total tree cover in West Midlands from 3.7% to 16.5% reduces average primary PM₁₀ concentrations by 10% from 2.3 to 2.1 µg/m³. This removes some 110 tonnes per year of primary

PM₁₀ from the atmosphere. Increasing tree cover in the West Midlands to a theoretical maximum of 54% by planting all available green space would reduce the average PM₁₀ concentration by 26%, removing 200 tonnes of primary PM₁₀ per year.

Similarly for Glasgow, increasing tree cover from 3.6% to 8% reduces primary PM₁₀ concentrations by 2%, removing 4t of primary PM₁₀ per year. Increasing tree cover to 21% would reduce primary PM₁₀ air concentrations by 7% removing 13 tonnes of primary PM₁₀ per year.

They concluded: "We have found that tree planting in urban areas is a worthwhile benefit to the areas included in this study,

and is a policy that could benefit other towns and cities. As PM₁₀ has a major impact on human health, reducing PM₁₀ is extremely beneficial.

The location of trees is important as individual trees will have more benefit than a forest, due to the edge effect. Species of trees is also important – trees with the largest surface area have the greatest potential to scavenge PM₁₀, while some species emit VOCs which can contribute to ozone formation.

Quantifying the effect of urban tree planting on concentrations and depositions of PM₁₀ in two UK concentrations, A McDonald et al, *Atmospheric Environment* Vol. 41 (2007) pp8455-8467.

VEHICLE POLLUTION

'Distance as a proxy' approach validated

UK researchers have studied the Runcorn area to compare modelling and distance approaches of assessing pollutant exposure.

The Runcorn area is heavily industrialised and many studies have been carried out to assess health impacts of the industry. Preliminary investigations revealed an excess risk of death from kidney disease among those living near various point sources when using distance as a proxy for exposure.

More sophisticated dispersion modelling techniques were used to assess mercury dispersion from three mercury emitting

sources. Model output correlated well with local monitoring data although the model underestimated concentrations close to a chlor alkali plant. The modelling showed that one of the three point sources did not have a significant impact on concentrations, a finding that would distort any attempt to use simple distance-based exposure assumptions.

Researchers conclude: "Crude, proxy measures of exposure are used in many point source epidemiological investigations often resulting in misclassification of exposure

and biased risk estimates."

They add that such proxy measures can be greatly improved by using dispersion modelling, but where modelling cannot be undertaken, more careful thinking about sources (especially emissions and stack height) could improve reliability of distance based epidemiological findings. **Assessment of exposure to mercury from industrial emissions: comparing 'distance as a proxy' and dispersion modelling approaches, Susan Hodgson et al, *Occup. and Environmental Medicine*, 2007, Vol. 64 pp380-388.**

PUBLIC HEALTH

Doctor call-outs increase with pollution

Paris doctors were called out more often in periods of high pollution.

French researchers compared the number of house calls with pollution levels to see if there was a link. Levels of PM_{2.5}, PM₁₀ and NO₂ were compared to call-outs for upper and lower respiratory disorders between 2000 and 2003.

1.76 million house calls were included in the study, of which 8027 were for asthma, 52,928

for lower respiratory disease and 74,845 for upper respiratory disease.

A 10µg/m³ increase in PM₁₀ and PM_{2.5} encountered within the previous three days was associated with a 3% and 5.9% increase in house calls for upper and lower respiratory diseases respectively. PM_{2.5} had a higher impact than PM₁₀, and the impact increased if considered with a 15 day lag.

Researchers point out that the

associations with house calls are more sensitive than that for mortality or hospital admissions, suggesting house calls may be a useful public health indicator for air pollution.

Air pollution and doctors' house calls for respiratory diseases in the Greater Paris area (2000-2003), Benoit Chardon et al, *Occupational and Environmental Medicine*, 2007, Vol. 64, pp320-324.

SCIENCE SHORTS

CHILD HEALTH

PAHs pose risk to children

Californian researchers say that Czech children have been found to be at risk from PAHs.

Pre school children were studied in a high and low pollution area – Teplice and Prachatic. Regular readings of PM_{2.5} and PAHs were taken and concentrations compared to medical histories of a cohort of children (1,133) followed to the age of four and a half years old.

Below the age of two, a 100ngm³ rise in PAH and 25µg/m³ rise in PM_{2.5} led to a 29% and 30% increase in the risk of bronchitis respectively. For those aged between 2 and 4.5yrs, the increased risks were 56% and 23% respectively for the rise in PAH and PM_{2.5}.

Researchers concluded: “Ambient PAHs and fine particles were associated with early life susceptibility to

bronchitis with stronger associations for longer averaging periods, and for younger children (less than two years old) especially for PAH. This is a significant public health threat to children.”

Early childhood lower respiratory illness and air pollution, Irva Hertz-Picciotto et al, *Environmental Health Perspectives*, Vol. 115 No. 10 2007 pp1510-1518.

DISPERSION MODELLING

Air pollution prompts cot deaths?

Air pollution can increase the risk of sudden infant death syndrome (SIDS), US researchers have found.

Birth and death records for babies born between 1999 and 2002 in US districts with more than 250,000 residents were compared to pollution data. Pollutants included PM_{2.5}, PM₁₀, ozone, sulphur dioxide and carbon monoxide with concentrations inferred for

infants in their first two months of life. The study included 3.5 million births, with 6,639 early deaths.

A 10µg/m³ increase in PM₁₀ was found to increase risk of respiratory death by 16%, and a 20% increased risk of sudden infant death syndrome for a 10ppb increase in ozone. Other causes of deaths and pollutants did not show an effect.

Researchers concluded: “This

study provides further support for particulate air pollution as a risk factor for respiratory related postneonatal infant mortality and suggests ozone may play a role in SIDS.”

Air pollution and post-neonatal infant mortality in the US, 1999-2002, Tracy Woodruff et al, *Environmental Health Perspectives* Vol. 116 No.1 2008 pp110-115.

OBJECTIVES

Pollution worse for diabetics

Diabetics in Boston USA have been found to be at risk from air pollution.

Daily average levels of PM_{2.5}, black carbon and sulphates were measured 500m from a lab where patients were examined

for inflammatory blood markers. Air pollution was found to be linked to the markers – with associations particularly strong for those not taking statins (drugs for diabetes).

Air pollution and inflammation in type 2 diabetes: a mechanism for susceptibility, M O’Neil et al, *Occupational and Environmental Medicine*, 2007, Vol. 64 pp373-379.

URBAN POLLUTION

Focus back on carbon monoxide

Carbon monoxide exerts an independent effect on mortality, European researchers suggest.

Short term effects were studied in 19 cities as part of the wide ranging and ‘most extensive’ Aphea 2 project (Air Pollution and Health: A European Approach). Ambient carbon monoxide levels have been falling across the EU but researchers say that there are health effects even at very low concentrations and there is no threshold for mortality effects.

A 1mg/m³ increase in the two day level of carbon monoxide

was associated with a 20% increase in total deaths and a 25% increase in cardiovascular deaths. There remained an effect even after the confounding effects of black smoke and nitrogen dioxide were taken into account.

The risks were higher in western European cities, followed by southern European cities. There was only a small and non significant effect in eastern cities: “Higher effects of carbon monoxide on mortality are observed in cities with lower mortality rates. In addition,

higher effects of carbon monoxide on total mortality are observed in cities with smaller numbers of carbon monoxide monitors and higher particle levels whereas the effect on cardiovascular mortality is higher in cities with lower ozone levels and higher proportion of the elderly.

Short term effects of carbon monoxide on mortality: an analysis within the Aphea project, Evangelia Samoli et al, *Environmental Health Perspectives* Vol. 115, no 11, 2007 pp1578-1583.

Fine particles affect birth weight

German researchers believe that fine particles (PM_{2.5}) can reduce birthweight.

Over 1,000 Munich women giving birth were studied who were taking part in the LISA study (Influences of Lifestyle related factors on the human immune system and development of allergies in children cohort). Babies were excluded if they were premature.

PM_{2.5}, PM_{2.5} absorbance (a blackness measure and assumed to be related to traffic density) and nitrogen dioxide levels were assigned to the mothers using land use regression models taking into account land use, traffic levels and population density. Exposure was calculated for 1016 births.

Researchers found an increased prevalence of lower birth weights (less than 3kg) for those with higher PM_{2.5} and PM_{2.5} absorbance rates. **Traffic related atmospheric pollutant levels during pregnancy and offspring’s term birth weight: a study relying on a land use regression exposure model, Rémy Slama et al, *Environmental Health Perspectives*, Vol. 115, No 9, 2007 pp1283-1292.**

PM₁₀ affects birth

Particles can affect birth outcomes with different effects at different trimesters of the pregnancy.

Korean researchers followed a cohort of women across a number of cities. They found that stillbirths rose by 10% with an increase of PM₁₀ in the third trimester, and birth defects rose by 16% with an increase of PM₁₀ during the first trimester.

They added: “We have found that PM₁₀ exposure increases the risks of adverse birth outcomes of premature delivery, low birth weight, slow growth, congenital abnormality and stillbirth.”

PM₁₀ and pregnancy outcomes: a hospital based cohort study of pregnant women in Seoul, Ok-Jin Kim et al, *Journal of Occupational and Environmental Medicine* 2007 Vol. 49 pp1394-1402.

Now the low emission zone in London is beginning to bite, we were amused by this story in *Horse and Hound* about how owners of old horse boxes are getting round the ban.

Horse boxes tend to be old but little used, perhaps coming out once or twice a month, so the prospect of paying out several thousand pounds to upgrade the specialised trucks may not appeal. And neither does the £200 charge.

So Mote End Stables in north London has found an unique wheeze for competitors visiting its events. The main entrance to the venue, in Mill Hill, north London, is within the new zone – but its land extends to a road on the edge of the LEZ and the centre is going to make a new “competition entrance” there.

Entrants can park up in a new car park – unload the horses which can then trot over to the event. Brilliant.

Porsche has threatened to challenge Mayor Ken Livingstone’s plans to charge £25 for Porsche’s and other gas guzzlers to drive in London.

Livingstone had a typically acerbic response: “Porsche is trying to impose on all Londoners unnecessary levels of pollution and greenhouse gases by a tiny

minority. No one is allowed to throw their rubbish in the street and Porsche should not be allowed to impose gas guzzling polluting cars on Londoners who do not want them.”

Good old Ken, when he is on the side of the angels he is priceless. But when in danger of following populism rather than science (eg incineration and biomass), his refusal to openly discuss matters is a little bit frightening.

Biofuel, biomass and domestic wind turbines are all suffering the (sadly typical) backlash after their initial flush of enthusiasm.

With bulk grain prices at record levels, the idea of using food crops to power vehicles seems unwise. Biomass is great provided its not in urban areas (where you need the heat and power) and domestic wind turbines are often all noise and no action, again in urban areas.

As if this isn’t enough, Belgian researchers have come up with another unintended consequence of encouraging home generation. They point out that if local generation is encouraged, there would be no need to build any more large power stations. That’s good.

But they point out that if no new,

efficient, power stations are built – the old inefficient ones won’t get phased out. And that isn’t good.

Green policy makers could despair at such perversities, but may quietly welcome the very high price of energy which will cut consumption and influence buying decisions in the right direction. Indeed, \$100 a barrel crude prices will do what the Gordon Brown’s fuel duty price escalator was intended to do – but the Government was too spineless to continue (and now it’s backtracked on road pricing as well, how weak).

We look forward in a year or two to hear how ‘government policies’ have driven down energy consumption and pollution!

Nanotoxicology will be studied in a new research programme for the Department of Health, UWE’s recent conference was told by Aberdeen’s Jon Ayres, standing in for the HPA’s Bob Maynard.

Maynard is managing the £650,000 nanotechnology research, leading Ayres to note dryly that the ‘national nanotoxicology inhalation centre’ will be Bob Maynard’s new ‘baby’, and adding: “This will be Bob’s new toy which he will no doubt play with until he retires.”

AIR QUALITY EVENTS 2008

10-11th March

GREENING TRANSPORT FLEETS

Sheffield City Council/Cenex two day exhibition and conference to be held in Sheffield website www.cenex.co.uk/news-industryevents.asp

15th March

AIR ANALYSIS – OUT OF THE LABORATORY AND INTO THE FIELD

RSC AAMG conference to be held at the National Physical Laboratory, Teddington, website <http://rsc-aamg.org/Pages/Meetings.html>

31st March

PLANNING AND AIR QUALITY

As a Beacon learning event, Greenwich is holding a conference to which EHO’s will be expected to bring their planning colleagues Contact John Paterson email john.paterson@greenwich.gov.uk

3rd-4th April

AIR QUALITY SPRING WORKSHOP

EPUK (ex NSCA) spring workshop, contact Lucy Salter, EPUK 01273 878770

15th-16th April

THE ELEVENTH ANNUAL REVIEW MEETING ON OUTDOOR AND

indoor air pollution research conference held by the Institute of Environment and Health conference to be held at Cranfield University, Website www.le.ac.uk/ieh

14th May

ANNUAL AIR QUALITY FORECASTING SEMINAR

organised by AEA to be held in London contact Iarla Kilbane-Dawe email I.Kilbane-Dawe@aeat.co.uk

23rd-25th June

12TH CONFERENCE ON COMBUSTION GENERATED NANOPARTICLES

to be held in Zurich www.lav.ethz.ch/nanoparticle_conf/index

11th June

INVESTIGATION OF AIR POLLUTION STANDING CONFERENCE

Iapsc conference to be held at the SOAS Brunei Gallery in London. Website www.iapsc.org.uk/

29th-30th September

INHALED PARTICLES

to be held in Manchester www.bohs.org/standardTemplate.aspx/Home/Events/InhaledParticlesXConference2008/Programme

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Copyright 2008 ISSN 1751-150X

Printed and published
by Environmental
Management Publishing Ltd

AIR QUALITY
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